REMARKS

In the Office Action mailed August 11, 2006, the Examiner rejected claims 1, 3, 5, 7, 9, 11, 13, 15-17, 19-20 and 24 are rejected under 35 U.S.C. §103(a) as being unpatentable over USPN 6,090,481 to DePauw in view of USPN 5,248,545 to Proscia. Claims 8 and 18 are rejected under 35 U.S.C. §103(a) as being unpatentable over USPN 6,090,481 to DePauw in view of USPN 5,248,545 to Proscia and further in view of USPN 5,837,361 to Glaser. Claims 1, 3, 5-7, 9, 11, 13, 15-17, 19-20 and 24 are rejected under 35 U.S.C. §103(a) as being unpatentable over USPN 6,090,481 to DePauw in view of USPN 5,248,545 to Proscia in view of USPN 6,030,671 to Yang in view of USPN 4,900,634 to Treneu. Claims 8 and 18 are rejected under 35 U.S.C. §103(a) as being unpatentable over USPN 6,090,481 to DePauw in view of USPN 5,248,545 to Proscia in view of USPN 6,030,671 to Yang in view of USPN 4,900,634 to Terneu and further in view of USPN 5,837,361 to Glaser. Applicant respectfully disagrees with the rejections, and with the characterizations of the art and Applicant's invention.

As has been previously stated in the last reply, as a starting point, it is useful to provide some background on the invention. The Applicant wished to have a low-emissivity coating that would not become hazy when tempered. To accomplish this, the Applicant conceived the idea of using an intermediate dielectric stack made up of several particularly thin layers formed from very different materials. Adjacent layers were formed from very different materials to keep crystals that grow in a layer during tempering from growing larger than the thickness of the layer. In more detail, by using very different materials for adjacent layers, crystal growth in a layer tends not to tie into crystal growth in adjacent layers. Thus, by keeping the thickness of each layer very small, crystals tend not to grow so large during tempering as to scatter light and cause haze.

Since the coating was intended to endure tempering, the intermediate dielectric stack of the coating needed to be stable when tempered, with low oxygen permeability. It was conceived to use film comprising silicon nitride, which Applicant discovered is particularly good for providing low oxygen permeability and stability when tempered. However, the Applicant determined that silicon nitride, when used at large thicknesses,

imparts a great deal of stress in the coating. (High stress, of course, is to be avoided, since it can lead to delamination of the coating.) Surprisingly, Applicant found that low stress levels can be achieved by using one or more very thin films comprising silicon nitride and splitting up the overall thickness of an intermediate coat among the film(s) comprising silicon nitride and one or more films comprising oxide or suboxide. (The oxide or suboxide film tends to have very different crystalline habits than the film comprising silicon nitride.) The Applicant clearly came upon unexpected results when they discovered the possibility to use one or more intermediate films comprising silicon nitride while still achieving low stress. Thus, some preferred embodiments of the invention involve using a plurality of films comprising silicon nitride in combination with a plurality of films comprising oxide or suboxide, where all the films comprising silicon nitride have lesser thickness than the films comprising oxide or suboxide. While Applicant maintains its invention is much broader in scope, these embodiments provide a surprisingly effective technique for breaking up the stress in an intermediate stack that incorporates silicon nitride to obtain low oxygen permeability and stable tempering.

Claims 1, 3, 5, 7, 9, 11, 13, 15-17, 19-20 and 24 are rejected under 35 U.S.C. §103(a) as being unpatentable over USPN 6,090,481 to DePauw in view of USPN 5,248,545 to Proscia. Applicant respectfully traverses this rejection.

Turning now to the prior art, as previously stated there simply is no teaching, suggestion, or other motivation in the DePauw reference that would even begin to render obvious the idea of providing an intermediate stack with two films comprising silicon nitride and three films comprising oxide or suboxide, wherein each film comprising silicon nitride has a lesser thickness than each film comprising oxide or suboxide. The Examiner states that DePauw does disclose that a variety of layer thickness combinations may be utilized (see Table A), however, the Examiner admits that DePauw is silent with regards to why the intermediate dielectric stack thicknesses are to be varied. In fact, the Examiner admits that DePauw does not mention a specific embodiment wherein each of the layers of the first dielectric have an optical thickness greater than the optical thickness of any of the layers of the second dielectric. In fact, the examples shown in Table A do not include silicon nitride although DePauw suggests that silicon nitride might be a suitable non-absorbent material. Moreover, DePauw does not suggest that when silicon

nitride is used that it have a thickness less than each film comprising oxide or suboxide. It is clear that DePauw does not address any of the stress issues caused by using silicon nitride in an intermediate dielectric layer. The Examiner relies on Proscia to provide the suggestion lacking in DePauw. The Examiner states that Proscia discloses that optical features and properties (transmittance, reflectance, emissivity, and color) of a glass coated article can be determined empirically by employing a commercially available software program and thus discovering an optimum value of layer thicknesses involves only routine skill in the art. However, there is nothing in DePauw that would lead one of ordinary skill in the art to seek to optimize DePauw's coating by varying the relative thicknesses of the individual layers making up an intermediate dielectric stack (referred to by DePauw as "non-absorbent 2" or "Ox-2") in the first place. DePauw is concerned with the visible transmission, visible reflection, color, and infrared reflection of a coating used on laminated glass. In controlling the optics and infrared reflection of the coating, the relative thicknesses of the individual layers making up the intermediate stack are not controlling; what matters is the total optical thickness of all the individual layers of the intermediate stack, as well as the total optical thickness of the base coat (referred to by DePauw as "non-absorbent 1" or "Ox-1"), the total optical thickness of the outer coat (referred to by DePauw as "non-absorbent 3" or "Ox-3"), the thicknesses of the infrared-reflective layers (referred to by DePauw as "metal 1" and "metal 2"), and the thickness ratios of non-absorbent 2 to non-absorbent 1 and non-absorbent 3 to non-absorbent 1. A careful review of DePauw shows these to be the only features with which DePauw is concerned. DePauw teaches specific total thicknesses for non-absorbent 1, for metal 1, for non-absorbent 2, for metal 2, and for non-absorbent 3. DePauw also teaches specific ranges for the total thickness of metal 1 plus metal 2. Further, DePauw teaches specific ratios for the thickness of non-absorbent 2 to the thickness of non-absorbent 1. These are the parameters that control the optics and infrared reflection levels. The relative thicknesses of the individual layers making up an intermediate dielectric stack do not control these properties. Proscia is concerned with the same thing, optical features and properties (transmittance, reflectance, emissivity and color) of the glass coated article, and thus does not add any additional teaching or suggestion to DePauw. Thus, nowhere in DePauw or Proscia is there motivation to provide an intermediate stack with two films

comprising silicon nitride and three films comprising oxide or suboxide, wherein each film comprising silicon nitride has a lesser thickness than each film comprising oxide or suboxide.

Turning to the second statement in the noted paragraph of the Office Action, the Examiner says "Considering that the current specification fails to teach or suggest unexpected results relating to the claimed thickness construction, and considering that the applicant fails to evidence any unexpected results associated with the claimed thickness construction, it would have been obvious ... to adjust the thicknesses of the layers". Thus, the Examiner suggests the unexpected results discussed above are not persuasive because they were not sufficiently discussed in the specification. This line of reasoning, however, is improper. The structure claimed (the relative thickness arrangement) is recited in the specification as being an embodiment of the invention. While the Examiner alleges the unexpected results are not described sufficiently in the specification, these unexpected results are real and must be considered. An applicable precedent was established in the case of *In re Zenitz*, 33 F.2d 924, 142 USPQ 158 (C.C.P.A. 1964). In that case, the Examiner refused to consider unexpected properties because they were not originally disclosed in the specification. The CCPA disagreed with the Examiner. The invention was a chemical compound that was useful as a hypotensive agent, antinauseant, antipyretic, and sedative. The Examiner rejected the claimed invention based on the prior art reference Cusic and various secondary references. The applicant conceded that the proposed combination resulted in the claimed invention; however, Zenitz contended it would not have been obvious to combine the references given the unexpected benefits resulting from the combination. The Examiner refused to consider the unexpected properties because they were not originally disclosed in the specification. On appeal, the CCPA disagreed with the Examiner. The court held that the specification supported the asserted unexpected properties even though it made no direct reference to them. The CCPA said:

> In the case before us Zenitz disclosed his compounds to be useful as tranquilizers as well as hypotensives, sedatives, etc. It is true he made no mention of the separation of hypotensive and tranquilizing activity, but...the advantage of minimized hypotensive activity would inherently flow from the indicated use of the compounds as tranquilizers.

Thus, so long as the unexpected benefits were a result of the claimed embodiment, they could be used to show nonobviousness. Accordingly, Applicant submits it is improper for the unexpected results of the presently claimed embodiments not to be considered.

Further, in the noted paragraph of the Office Action, the Examiner says that "...it is understood by one of ordinary skill in the art that layer thicknesses determine properties such as transmittance, reflectance, emissivity, and color...". As discussed above, in controlling the transmittance, reflectance, emissivity, and color of the coating, the relative thicknesses of the individual layers making up an intermediate stack are not controlling. Rather, what matters is the total optical thickness of all the individual layers of the intermediate stack, the total optical thickness of the base coat, the total optical thickness of the outer coat, the thicknesses of the infrared-reflective layers, and the thickness ratios of intermediate stack to base coat and outer coat to base coat. Thus, nowhere in DePauw is there motivation to provide an intermediate stack with two films comprising silicon nitride and three films comprising oxide or suboxide, wherein each film comprising silicon nitride has a lesser thickness than each film comprising oxide or suboxide.

Thus, it is believed that independent claims 1 and 11 are patentable over the cited art. Claims 3, 5, 7, 9, 13, 15-17, 19-20 and 24 are dependent on either claim 1 or 11 and are believed to be patentable for at least the same reasons. Applicant respectfully requests that the rejection be withdrawn.

Claims 8 and 18 are rejected under 35 U.S.C. §103(a) as being unpatentable over USPN 6,090,481 to DePauw in view of USPN 5,248,545 to Proscia and further in view of USPN 5,837,361 to Glaser. Claims 8 and 18 are dependent on claims 1 and 11 respectively, and are thus believed to be patentable for at least the same reasons already given.

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do not cure the deficiencies in DePauw and Proscia. Yang merely discloses that silicon nitride protects an infrared reflective layer and can be placed on that layer. Terneu merely describes that internal haze tends to be greater the greater the thickness of the coating. Applicants do not believe Yang and Terneu supply the teachings or suggestions missing from DePauw and Proscia. Applicants respectfully request the withdrawal of the rejection.

Claims 8 and 18 are rejected under 35 U.S.C. §103(a) as being unpatentable over USPN 6,090,481 to DePauw in view of USPN 5,248,545 to Proscia in view of USPN 6,030,671 to Yang in view of USPN 4,900,634 to Terneu and further in view of USPN 5,837,361 to Glaser. Claims 8 and 18 are dependent on claims 1 and 11 respectively, and are thus believed to be patentable for at least the same reasons already given.

In view of the foregoing remarks and amendments, Applicant submits that the outstanding obviousness rejections should fairly be withdrawn.

Respectfully submitted,

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